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### **Surgical management of complex fracture dislocation of proximal humerus: A report of two cases**

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#### **Abstract**

Fracture dislocations of the proximal humerus are extremely rare and have poor functional and radiological outcome regardless of many available surgical interventions. We present two such cases where a post traumatic complex fracture dislocations managed by contrasting surgical interventions. Two cases presenting to our institution aged 32 and 58 years managed surgically are reported in this study. The surgical intervention and the implant chosen was with respect to their age and socio-economic status of the patients, which has resulted in a cost effective radiological outcome.

**Keywords:** Proximal humerus fracture dislocation, shoulder hemiarthroplasty

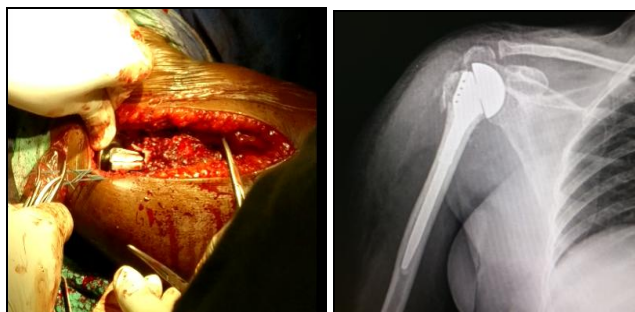
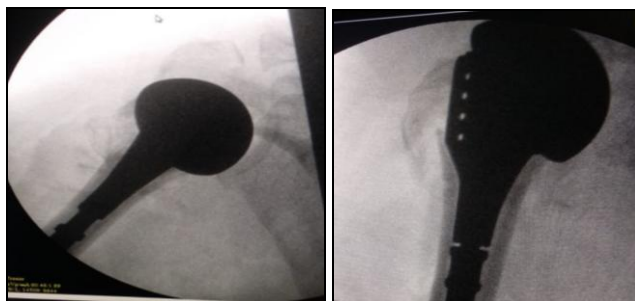
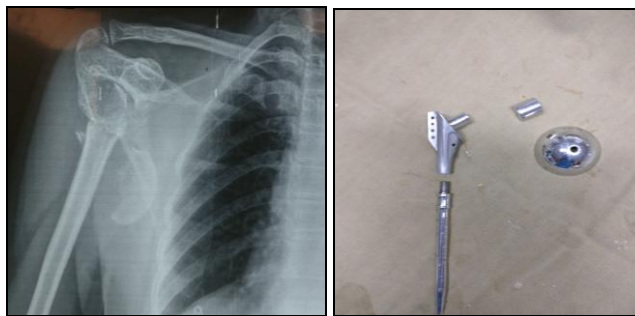
#### **Introduction**

Fracture dislocations of the proximal humerus are rare and have poor functional and radiological outcome regardless of a variety of available surgical interventions. We present two such cases where a post traumatic complex fracture dislocations managed by contrasting surgical interventions taking their age and future functional requirement of the affected joint into consideration. Fracture dislocations of the proximal humerus usually follows high energy trauma and mandates surgical treatment irrespective of the age. Concentric reduction and Anatomical Reconstruction with Osteon synthesis is preferred in a relatively younger age group so as to preserve the head of humerus. The treatment is determined by the age and medical status of the patient and the degree of deva secularization and fragmentation of the humeral head and tube rosities. It has been suggested that for defects that involve less than 20% of the articular surface, closed reduction can be attempted. Open reduction is necessary for defects that involve 20% to 40% of the surface. Hemi-author plastic or total shoulder replacement is generally regarded as a better option for fracture dislocations and for multipart fractures in the elderly, as they offer rapid recovery <sup>[1]</sup>.

**Case Report:** Case: 1 - A 56 years old female with history of slip and fall on her right shoulder at her home, sustained a Neer's four part antero inferior fracture dislocation of the proximal humerus without neurovascular compromise with the dislocated head lying in the axilla and the remaining tube rosities separated from each other with their respective muscular attachments. CT scan was done to delineate the pathoanatomy and plan for hemiarthroplasty with reconstruction of the surrounding greater and lesser tube rosities. The conventional deltopectoral approach was used with patient in supine position and under inter scalene block augmented with general anaesthesia. We used 2 size Ethibond sutures to take control of the greater and lesser tube rosities with its muscular attachments. The head of humerus



Lying in the axilla was retrieved

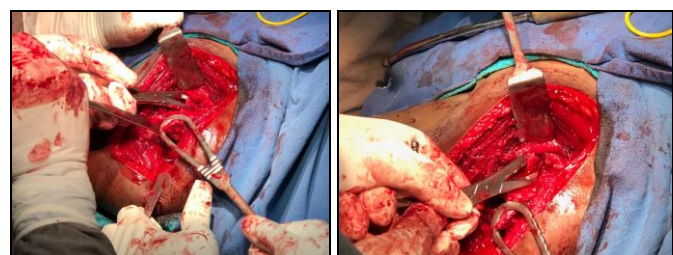


**Case 1:** Preoperative x ray and CT scan showing the Fracture dislocation. Postoperative Active Range of Motion mobilisation started at end of 2 weeks.

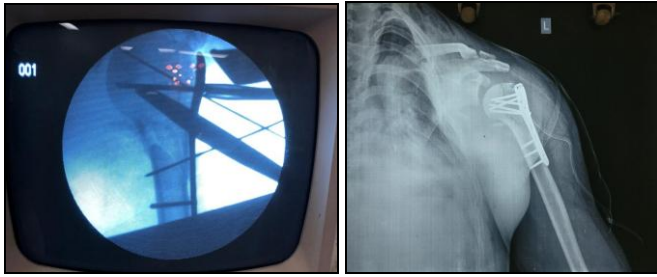
into to through the incision and measured to be 39mm. Serial reaming of the proximal humerus was done and trial

prosthesis inserted, found to be satisfactory. Appropriate modular hemiarthroplasty prosthesis (ORTHO TECH) was assembled and inserted with 20 g of bone cement in 30 degrees retroversion. Following which greater and lesser tuberosity controls were sutured back together with bone graft harvested from the retrieved head of humerus. Postoperatively, the arm was immobilized with an arm pouch sling and active shoulder range of motion exercises were advised from two weeks follow up.

**CASE 2:** A 32 year old male who presented to our institution with history of toppling over from a two wheeler while riding as a pillion rider and landing on his left shoulder joint, sustained a Neer's three part posterior fracture dislocation with concomitant 2<sup>nd</sup> to 5<sup>th</sup> ribs, comminuted body of scapula, un displaced acromial end of clavicle fracture. With the help of CT scan, PHILOS plate osteosynthesis was planned for proximal humerus fracture. Under interscalene block augmented with general anaesthesia with the patient in supine position, through the conventional deltopectoral approach, comminuted fragments were retracted and the articular surface was posterolaterally rotated due to pull of the subscapular is on the lesser tubercle following the fracture through the anatomical neck of humerus. Hence subscapular is muscle was divided to allow derotation and relocation of the dislocated articular fragment and subsequently reattached. Postoperatively, the arm was immobilized with an arm pouch sling and active shoulder range of motion exercises were advised at three weeks follow up.







**Case Report 2:** Intraoperative image showing derotation of the articular fragment and Post-operative follow up at 4 weeks.

### Discussion

Fracture dislocations of proximal humerus are rare and anterior fracture dislocations are much more common than posterior [2]. First patient in our case report had an anterior fracture dislocation where the humeral head fragment had dislocated and displaced into the axilla. There has been few instances in literature where the dislocated fragment had been displaced into the axilla and injury to the axillary artery has been documented. Hoffman *et al.* (2011) have demonstrated that use of endovascular stents for axillary artery injury by the spike of medial humeral shaft has resulted in better outcomes than many other vascular re canalization procedures. Neurovascular injury to the surrounding brachial plexus and axillary artery have previously been reported in 6.2% [3]. And 0.09% [4]. Of patients respectively. Care had to be taken not to injure the axillary vessels during retrieval of the head from the axilla. Hence it is imperative to mind the neurovascular structures adjacent to the head while retrieving it. Fortunately in our case we did not come across any of the above complications.

The next patient (Case 2) had a peculiar pathoanatomy where the articular surface was rotated posterolaterally and there was no sufficient literature so as to how this type of fracture dislocation could be managed intraoperatively where open reduction internal fixation is planned. Relocating the fracture dislocation was difficult because of the sharp metaphyseal bone spikes. We found that dividing the subscapular is neutralises the deforming force that tilted the humeral head articular fragment posterolaterally so that it can be relocated back only to be ligated again after fracture fixation with the low profile locking compression plate. Ito *et al.* (2000) [5], reported a case of three part posterior fracture dislocation where the articular fragment was dislocated posteromedially. Coronal reconstruction images give more detail about the alignment of the humeral head and they allow assessment of comminution at the level of the humeral calcar, the integrity of the infer medial hinge, and extent of metaphyseal fracture extension. Sagittal reconstructions help in determining whether there is a flexion or extension deformity of the proximal humerus with regard to the shaft. Furthermore, in this plane, using a soft tissue window, fatty atrophy of the rotator cuff muscles may be analyzed, which may be of value in patients with questionable preinjury rotator cuff pathology [6].

### Conclusion

Care needs to address with utmost respect to the surrounding neurovascular structures while retrieving the displaced head of humerus. Even better, a standby vascular surgery team. Dividing and resuturing the subscapular is tendon in complex proximal humerus fractures with fracture line extending in the anatomical neck may be inevitable so as to

achieve anatomical reduction in posterolateral fracture dislocation of the proximal humerus.

### Disclaimer

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